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Anne Vachon Dougherty 5/14/01  
Signature & Date

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of : May 14, 2001  
A. Narasimhan, et al : Group Art No.: 2747  
Serial No. To be assigned :  
Div of 08/935,979 : Examiner: C. Cheney  
Filed: May 14, 2001 : for IBM Corporation  
Anne Vachon Dougherty  
Title: ACOUSTIC QUALITY 3173 Cedar Road  
ENHANCEMENT VIA FEEDBACK Yorktown Heights, NY 10598  
AND EQUALIZATION FOR  
MOBILE MULTIMEDIA SYSTEMS

**PRELIMINARY AMENDMENT**

Commissioner of Patents  
Washington, D.C. 20231

Sir:

This Preliminary Amendment is being filed simultaneously with the filing of a Continuing Prosecution Application (CPA)-Divisional application for the above-identified patent application. The Preliminary Amendment cancels the previously-prosecuted method claims and introduces apparatus claims for prosecution. Applicants respectfully submit the following amendments:

Cancel Claim 1 from the case as originally filed.

Add Claims 2-9 as set forth on the following pages.

## NEW CLAIMS

2. Apparatus for rapidly enhancing audio quality of an input audio signal in a portable computing system having limited resources and having a reproduction medium with unknown characteristics, comprising:

a. a generator component for generating a predetermined finite set of M single frequency tones and for passing said set of tones to said reproduction medium to generate a subsequent output signal;

b. a set of sub-band filters for receiving said subsequent output signal wherein each of the sub-band filters passes at least a frequency corresponding to one of the M tones;

d. an estimating component for estimating the unknown characteristics of said reproduction medium by examining outputs of each of said sub-band filters after passing said subsequent output signal through said medium to produce gain estimates; and

e. at least one filter construction component for dynamically constructing a set of sub-band inverse filters to compensate for the estimated characteristics of the reproduction medium, wherein, before passing an input audio signal through said reproduction medium, said audio signal are passed through said inverse filters, thereby improving the audio quality after the audio signal passes through said reproduction medium.

3. (Added) The apparatus of Claim 2 further comprising decomposition component for decomposing the audio signal into frequency sub-bands prior to passing the audio signal through the inverse filters.

4. (Added) The apparatus of Claim 2 further comprising a reconstruction component for reconstructing an output audio signal from the filtered frequency sub-bands.

5. (Added) The apparatus of Claim 3 further comprising a reconstruction component for reconstructing an output audio signal from the filtered frequency sub-bands.

6. (Added) The apparatus of Claim 3 further comprising a pre-emphasis component for pre-emphasizing the signal after said decomposing based on the gain estimates.

7. (Added) The apparatus of Claim 4 further comprising a pre-emphasis component for pre-emphasizing the signal after said decomposing based on the gain estimates.

8. (Added) The apparatus of Claim 5 further comprising a pre-emphasis component for pre-emphasizing the signal after said decomposing based on the gain estimates.

9. (Added) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for rapidly enhancing audio quality of an input audio signal in a portable computing system having limited resources and having a reproduction medium with unknown characteristics, said method comprising:

a. generating a predetermined finite set of M single frequency tones;

b. passing said set of tones through said reproduction medium to generate a subsequent output signal;

c. passing said subsequent output signal through a set of sub-band filters, each of the sub-band filters passing at least a frequency corresponding to one of the M tones;

d. estimating the unknown characteristics of said reproduction medium by examining outputs of each of said sub-band filters after passing said subsequent output signal through said medium to produce gain estimates;

e. dynamically constructing a set of sub-band inverse filters to compensate for the estimated characteristics of the reproduction medium; and

f. before passing an input audio signal through said reproduction medium, passing said audio signal through said inverse filters, thereby improving the audio quality after the audio signal passes through said reproduction medium.

# REMARKS

The Divisional Application is being filed to pursue apparatus claims which parallel the originally-filed method claims that have been allowed. The Preliminary Amendment cancels the previously-prosecuted method claims and introduces the apparatus claims for prosecution. No new matter is introduced by this Amendment.

Respectfully submitted,

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